

1863.

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BOROUGH OF CARDIFF.

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THE  
TENTH ANNUAL REPORT  
ON  
*Sanitary Condition of Cardiff.*

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CARDIFF:  
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THE  
Tenth Annual Report  
ON  
SANITARY CONDITION OF CARDIFF.

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*To the Cardiff Local Board of Health.*

CARDIFF, May, 1863.

GENTLEMEN,

The result of my examination of the registry of births and deaths enables me to report to you to day, that the sanitary condition of the Town of Cardiff during the past year has been satisfactory, that the deaths have been below the average of previous years, as also below the average mortality of towns throughout the kingdom. The special character of the diseases causing the mortality will be alluded to in another part of this report.

I shall first direct your attention to the population of the town. In doing this it may be interesting to divide it into two sections, one section comprising its Welsh and English portion, the other its Irish. The first may be estimated at 25,850, the second at 5,850. That the basis on which I form this estimate is a correct one, I have to refer you to the report I made to your board in 1861, wherein the population was estimated as 31,150: three months afterwards, on the publication of the census, it was found to be 31,225. This constitutes what may be termed the population proper of the town of Cardiff; but there is also another portion which contributes largely to your death register, not alone from the ordinary diseases incidental to the individual, but also from accidents to which this class is exposed from the nature of its occupation, and which comprises a considerable number of those deaths on which a coroner's inquiry becomes necessary. I mean the seamen constantly in the port.

The absolute number of these varies according to the prevailing winds. When the last census was taken, easterly winds had cleared the port to a minimum degree, reducing the number to less than 3000. This is little in excess of the number given in 1851, when the dock accommodation was limited, and the present large export trade of the port undeveloped. From data furnished to me by an authority competent to judge, the average number of seaman in the port may fairly be estimated at 4,000. The population of the town and port of Cardiff therefore stands as under :

Welsh, English, and others.....	25,850
Irish .....	5,850
Seamen .....	4,000
	<hr/>
	35,700

a number less than in 1857 from a cause I have explained in a previous report, namely, the labour fields in the suburbs now having house accommodation which they did not possess in that year.

In making my tenth annual report, I may be allowed to direct your attention to the important changes which have taken place in the town during this period—changes influencing the health and mortality of its inhabitants to an extraordinary degree, many of which have been carried out by your board at considerable cost, but with important corresponding results.

In 1850, according to a report made on the sanitary condition of Cardiff, the town was described as being

“Built on a low flat, very little above the level of the sea; the highest part, that being near the Town Hall, is not more than ten feet above that level. It is unfavourably situated as regards its low level for drainage. The surface drainage is insufficient, part of the town being flooded, and having at times a large surface of stagnant water exposed. With the exception of a small portion of the town, there is no provision for drainage; and even where such provision exists, it is extremely defective.

“The privy accommodation is bad; in consequence the streets are in a filthy state from slops and nightsoil thrown on them.

“The public supply of water is bad, and obtained at great cost and inconvenience by the inhabitants. There is only one public pump of tolerable drinking water, and this frequently dry, and at such times is locked up. A large number of the wells, public and private, are more or less affected, and the water contaminated by the leakage of cesspools and filthy surface drainage.

“There is a great deficiency of house accommodation in proportion to the large and increasing population, particularly of the poorer classes, who, encouraged by the facilities of transit, have been attracted to the town in large numbers, from the south of Ireland and other places, by the public works going on in it. That in

consequence, the rents of the poorer tenements are invariably high, whilst the accommodation afforded is limited and bad; and that a system of overcrowding is carried on, probably unequalled in any part of the kingdom, with the most fearful results upon the health and morals of the town.

"The sickness and mortality from fevers and contagious diseases (the zymotic), preventible by ordinary sanitary precautions, is excessive, particularly in the lower parts of the town, causing a heavy expense to the union.

"The result of such a deplorable condition of the town is illustrated by showing that on a decennial period ending in 1849, the rate of mortality was 30 per thousand on the total population, and that during the same period, the total number of deaths exceeded the births."

I have now to enumerate some of the most important remedial measures carried out in this town to meet the requirements alluded to in that report.

An extensive, and it is believed an efficient system of drainage, has been executed by your board, to remove the whole of the surface water and sewage from the town.

67 streets, where the roadways presented previously a large surface area of putrescent mud mixed with animal and vegetable refuse, emitting malarious exhalations, have been pitched and paved, and 17 courts have been flagged. These improvements have not alone remedied the external sources of disease, but have stimulated the occupiers of the houses to observe cleanliness internally; have enabled them to remove accumulations hitherto allowed to remain in the back yards, from difficulty of access of carts to do this. There are, however, still certain streets and districts requiring the exercise of the powers delegated to you, to remove like existing evils. I would instance the northern ends of Gough-street and Eisteddfod-street, the whole of Havelock-street, Sandon-place, Grange-town, and Catherine-street, Cathays.

To illustrate the effects of these improvements, both in a sanitary and social point of view, I would call your attention to the streets on the south side of the South Wales Railway, and contrast them with Sandon-place. The same class comprises the occupiers of either, but the first possesses as much comfort and cleanliness as can be expected among such a class; in the second these are wanting, with a corresponding increase of diseases of a febrile or zymotic character among the inhabitants; and as these are labourers whose improvidence with many is too well known, and whose scanty earnings with others renders them unable to maintain themselves and families during sickness; this necessitates a frequent demand on your poor-rates. In

the event of an outbreak of epidemic disease, the mortality in Sandon-place would be great ; nor would its effects be confined to this immediate locality, where the predisposing and exciting causes of disease exist in a high degree ; but these would so develop an intensity of poison as to make its deadly influence felt in the neighbourhood where the inhabitants are more observant of sanitary provisions.

A company has been established for furnishing the town with a supply of water. Latterly complaints have been made of its quality, in consequence of the large amount of earthy matter contained in it after rain ; this arises from the inadequate means for filtering, the demand for water exceeding the original calculations of the promoters of the works, owing to the rapid growth of the town and suburbs. Other filter beds are in the course of construction and in partial use, which, when complete, will it is believed effectually remove such cause for complaint.

The town slaughter-houses have been made more convenient, and afford such increased facilities for slaughtering as will enable butchers to conduct this part of their business here instead of doing so on their own premises, where they are unfitted for such a purpose, and are calculated to be a nuisance to the neighbourhood, and also a source of disease. I have to call your attention to the small number of butchers who, when allowed to slaughter on their own premises, comply with your requirements ; and I would especially urge on your board, on sanitary grounds, the expediency of preventing private slaughtering as far as practicable.

A constant supervision of the lodging houses is carried on, as perfect as the limited powers of the Act of Parliament will admit. These houses in Cardiff exceed in number 300. During the past year 4,150 visits by night, and 7,300 by day, have been made by Inspector Hibbs, who reports on their condition, returns the number of inmates when these exceed that certified by myself as your Officer of Health ; directs cleansing of the floors, limewashing of the walls, and removal of external nuisances when found to exist on the back premises. A very creditable readiness is now evinced in following these instructions, so that only 21 applications have been made to the magistrates for summonses in consequence of disobedience. Some

of the offenders have been fined, and others dismissed with a caution.

These are among the most important of the means adopted for the preservation of the public health and the prevention of zymotic disease. The effect will be recognized when your attention is directed to the tables illustrating the specific causes of mortality in the town during 1862, and also five previous years.

The weather during the year upon the whole was favourable to the public health. Throughout the first or winter quarter the temperature was above the average. The excess of rain, with cold winds, prevalent during the spring months, increased the mortality from infantile diseases, as measles, croup, and whooping cough, as will be spoken of again. The low range of temperature ruling the summer quarter repressed malarious exhalations, and there was a great absence of zymotic febrile diseases. The autumn quarter was exceedingly mild; the town was unusually healthy, and contrasted very favourably with other parts of the kingdom, from many of which reports of the existence of fever was made to the Registrar General: in some districts the rate of death reached as high as 26 per thousand; in London it was 24, while in Cardiff it was under 20.

The births in Cardiff during 1862, were 1,268; of these 1,034 were of Welsh, English, and other parentage, and 234 of Irish. Among the first, 60 or 5.8 per cent. were illegitimate; among the second, 15 or 6.4 per cent.—the average proportionate number of illegitimate births to total births throughout the kingdom being 7 per cent.; so that in Cardiff, with all the evils incidental to over-crowding from inadequate house accommodation, illegitimacy is less frequent. This would read still more favourably when it is borne in mind that a large proportion of these take place in the union-house, where the parents have been removed for their accouchements from rural districts.

I may here allude to an apparent discrepancy which may be supposed to exist in this return and that made by the Registrar General. This arises from the circumstance that I include only such as are actually born during the year: the Registrar General enumerates those registered; and as 42 days are allowed the parent to register a birth, many are included

in his return which have taken place during the previous year, and others are omitted to be included in the subsequent one. This discrepancy may be trifling on a term of years, but when the comparative births and deaths are taken to indicate the sanitary condition of a locality, I have considered it desirable to be correct. This necessarily delays the period of furnishing you with this report.

728 deaths took place during the year, and were registered in each quarter as follows :

WINTER	{	January .....	69	
		February .....	57	
		March .....	73	
			—	199
SPRING	{	April .....	55	
		May .....	64	
		June .....	59	
			—	178
SUMMER	{	July .....	49	
		August .....	45	
		September .....	48	
			—	142
AUTUMN	{	October .....	52	
		November .....	49	
		December .....	58	
			—	159
				678
		Inquests.....	50	
				728

Of these 390 were males and 338 females.

The following table illustrates the excess of births over deaths in each year from 1850 ; previous to that year, on a decennial period ending 1849, the gross number of deaths had exceeded the births by 30 :

Year.	Total Births.	Total Deaths.	Excess of Births over Deaths.
1850	504	495	9
1851	575	525	50
1852	696	642	54
1853	865	644	221
1854	950	925	25
1855	1079	661	418
1856	1227	772	455
1857	1367	883	484
1858	1356	754	602
1859	1336	826	510
1860	1246	662	584
1861	1223	812	411
1862	1268	728	540

Since that period it will be observed that a change in the relative proportion has taken place. In 1850 the births exceeded the deaths by 9 ; at this time commenced the process of regulating the internal condition of the houses of the poor and the removal of nuisances ; in 1853 the excess of births over deaths had increased to 221 ; in 1854 the visitation of cholera occurred, and was fatal in 175 cases ; with it also the allied diseases diarrhoea and dysentery produced 26 deaths, making total of 201 deaths from these three causes. The excess of births over deaths were thus reduced to 25. From this time commenced the drainage works, the extent of which can be comprehended by referring to the report made to you by your surveyor, Mr. Waring, who states that in three years, ending 1858, the sum expended in public and private drainage exceeded £42,000, and £6,627 in repairs of streets, such as pitching and paving ; to set off against this, in the annexed table will be seen a large and increasing excess of births over deaths, which now reaches 540 ; the greatest yearly excess being in 1858, when the population was considered to be larger than now, from causes previously alluded to.

The population contributing to this death return being estimated at 35,700, we have now to consider its death rate.

The death rate throughout the country has been divided into two sections. In the first, namely 125 districts and 23 sub-districts, comprising the chief towns, the death rate was 23·78 *per thousand*. In the second, the remaining districts and sub-districts of England and Wales, comprising chiefly small towns and country parishes, where the excitants of disease may be supposed to exist in a minimum degree, the death rate was 19·21 ; the average rate of these two sections being 21·49.

The following table shows the death rate in Cardiff since 1850 :—

Year.	Estimated Population.	Total Deaths.	Rate of deaths to every 1000 Inhabitants.
1851	18,351	525	28·60
1852	21,500	642	29·86
1853	24,000	644	26·83
1854	26,500	925	34·90*
1855	29,500	641	21·72
1856	34,923	772	22·10
1857	38,000	883	23·23
1858	37,000	754	20·37
1859	37,000	826	22·32
1860	35,000	662	18·91
1861	35,000	812	23·20
1862	35,700	728	20·39

\* The Cholera Year.



In 1854 the town was visited by epidemic cholera, destroying 175 lives; in 1857 small pox produced a mortality of 161; and in 1859 scarlatina of 87.

In Cardiff, during the past year, 728 deaths have been registered. The population being estimated at 37,500, the death rate has been 20·39 per thousand. It has therefore been 3 per thousand less than the death rate of the first of the above section, and slightly more than 1 per thousand on the second. From this analysis, the death rate of Cardiff contrasts most favourably with the mortality ruling the kingdom.

The importance of considering the death rate consists in this,—that while in certain districts only 17 per thousand of the inhabitants die annually, in others the mortality is nearly doubled, not on the special occasion of an epidemic visitation, for it then even exceeds this; but this rate is maintained for a series of years. When this excess exists, there are disturbing influences operating, which are emphatically described by Mr. Farr, “removable and excitant causes.” These being removed, a diminished death rate invariably follows. Thus, Liverpool on an average of years had formerly its death rate of 36 per thousand, the town being free from epidemic diseases. In 1847, there was introduced into it the fearful “Famine Fever of Ireland,” when the mortality reached the unexampled death rate of 70 per thousand. Sanitary reforms have been carried out, and the annual death rate of Liverpool has been of late years reduced to 26 per thousand. In our own town, as I have shown, before sanitary measures were adopted, its death rate was 30 per thousand, it is now reduced to 20. The saving of life, therefore, on the 10 years has been annually in excess of 300, or above 3,000 on the period. Its pecuniary saving I will presently illustrate in a calculation made by Mr. M’Gowan, of Liverpool, and read before the meeting of the Social Science Association in that town, in 1858.

The following table illustrates the causes of death during 1862 and five preceding years:

## CAUSES OF DEATH FOR SIX YEARS.

DISEASE.		1857.	1858.	1859.	1860.	1861.	1862.	
SPORADIC DISEASES OF KNOWN SEAT.	Diseases of Brain and Nervous System.	Convulsions .....	111	75	101	68	61	66
		Inflammation & Dis. Brain .....	21	15	19	11	25	23
		Apoplexy .....	9	1	14	9	9	1
		Paralysis .....	8	4	6	4	5	3
		Epilepsy .....	11	5	3	4	1	8
		Delirium Tremens .....	3	3	1	0.	3	0
		Insanity .....	0	0	0	0	0	0
		Hydrocephalus .....	16	19	7	14	21	3
		Diseased Spine .....	3	1	1	0	3	1.
	—182							—105
	Diseases of Chest.	Phthisis .....	106	81	84	127	103	97
		Bronchitis .....	30	21	15	30	63	44
		Inflammation of Lungs ..	53	87	77	46	79	54
		Pleurisy .....	0	2	2	5	0	1
		Asthma .....	4	3	9	2	7	1
		Hydrothorax .....	3	0	0	0	0	0
		Empyema .....	0	0	0	0	0	0
		Laryngitis .....	0	0	0	0	1	2
		Disease of Heart .....	9	27	14	27	23	27
	—205							—226
	Diseases of Regional Cavities.	Disease of Stomach ....	0	0	2	1	2	0
		"    Liver .....	3	4	8	9	12	7
		"    Bowels .....	15	23	12	6	11	10
		"    Kidney .....	4	5	1	6	11	9
		"    Bladder .....	3	0	0	0	0	2
		"    Womb .....	1	0	0	0	0	1
		"    Esophagus ..	0	3	1	1	3	0
	—26							—29
	Zymotic Diseases.	Fever, Contd. and Typ..	20	19	42	35	13	22
		"    Puerperal .....	6	4	9	4	10	5
		"    Scarlet .....	5	9	87	10	4	7
		"    Rheumatic .....	1	3	1	1	1	0
		"    Intermittent .....	1	0	0	0	0	0
		Measles .....	6	6	37	2	60	17
		Small Pox .....	161	8	0	0	1	3
		Whooping Cough .....	8	54	8	24	11	25
		Croup .....	10	19	12	5	38	5
		Diarrhoea and Dysentery.	21	16	16	15	19	9
		Cholera .....	1	0	0	0	0	0
		Erysipelas .....	3	4	0	1	2	1
		Diphtherite .....	1	5	12	5	5	10
	—244							—137
	Sporadic Diseases, Uncertain Seat.	Anæmia .....	0	0	1	0	0	0
		Stomatitis .....	0	0	1	0	3	0
		Phlegmon .....	7	3	4	5	3	1
		Scrofula .....	0	2	9	4	5	6
		Gangrene .....	3	1	2	1	1	2
		Cancer .....	8	2	10	1	8	6
		Syphilis .....	0	0	4	7	2	4
		Hæmorrhage .....	1	3	2	1	0	4
		Dropsy .....	8	10	10	9	4	5
		Atrophy, Deb. & Mesentery	63	71	65	52	101	90
		Hydrophobia .....	0	0	0	0	0	0
		Hernia .....	4	3	1	3	0	3
		Scorbutus .....	0	0	0	0	0	0
		Teething .....	4	7	7	3	10	9
		Exhaustion .....	0	3	0	0	0	0
		Gout .....	1	0	1	0	2	0
		Other Diseases .....	13	9	4	1	3	6
		Tetanus .....	0	0	2	0	0	0
		Tabes .....		0	0	1	0	0	0
		Disordered Joints .....		0	0	1	0	0	0
		Congenital .....		0	0	0	1	0	0
	—112							—136
Age .....		19	38	19	26	26	30	
Unknown .....		25	16	15	15	12	12	
Accidents .....		4	2	10	4	5	3	
Inquests .....		66	58	56	58	45	50	
Total .....		883	754	826	662	812	728	

The causes of death may be divided into two classes.

1st. Those arising from sporadic diseases, and are dependent on the individual. This class is not directly amenable to laws over which a sanitary board may exercise control; but a neglect of sanitary provisions may still affect the health and mortality of a district in an indirect manner. Thus, an overflowing cesspool, an ill-ventilated lodging-house, or the malarious exhalations from the roadways of a street such as I have described, will not give rise to inflammation of the lungs in the adult, or to an attack of convulsions in an infant; but these may so deteriorate the vital powers of the individual as to make him little equal to resist the consequences of such attack; and the mortality even from causes of this class will be great in a district such as I have described.

2nd. Those occasioned by zymotic diseases. This class comprises such as are pronounced to be in a great measure dependent entirely on causes which are removable or preventable. Mr. Simon, the medical officer of the Privy Council, speaks thus strongly on this class, "That the local excesses of fatality are due to local circumstances of aggravation; that these aggravating local circumstances are such as it is fully possible to counteract; and that of the total mortality ascribed to those influences in England, a very large share is preventable." These producing diseases, "which it is hardly a metaphor to say, that they consist in the extension of a putrefactive process from matters outside the body to matter inside the body; diseases of which the very essence is filth; diseases which have no local habitation, except when putrefiable air or putrefiable water furnishes means for their rise or propagation; diseases against which there may be found a complete security in the cultivation of public and private cleanliness."

The annexed table distinguishes the deaths from sporadic and zymotic diseases:

Year.	In-quests.	Deaths from Sporadic causes.	Deaths from Zymotic causes.	Total Deaths.	Per centage of deaths from Zymotic to total deaths.
1853	60	445	139	644	21.58
1854	60	507	358	925	38.70
1855	58	499	84	641	13.10
1856	75	542	155	772	20.07
1857	66	573	244	883	27.63
1858	58	549	147	754	19.49
1859	56	546	224	826	27.11
1860	58	502	102	662	15.40
1861	45	628	139	812	17.11
1862	50	541	137	728	18.81

I have this year amended this table by making it in accordance with the Registrar General. I had previously grouped deaths from croup among diseases of the respiratory organs; this year the deaths from this cause are inserted with the zymotic diseases.

From this table it will be perceived that in every year during which the mortality was excessive, the excess depended on deaths from zymotic diseases; that the deaths from sporadic diseases vary but little, exhibiting only an increase concurrent with an increase of population.

In the first subdivision of deaths from sporadic diseases (table, page 11) there will be found little calling for special observation, the most fatal disease in this class being convulsions. The deaths registered from this disease were 66, being at the rate of 1·8 per thousand of population. The average death rate of the whole kingdom from convulsions on a septennial period was 1·3 per thousand. During the same period, in the Merthyr Union district it was 3·8, in the Swansea 2·4, and in the Abergavenny 2·5. The remaining deaths among diseases of brain and nervous system observe the ordinary average.

Among diseases of the respiratory organs, phthisis was fatal in 97 cases, and was thus under one-seventh of total deaths. The deaths from this disease this year may be considered about the ordinary average in Cardiff. The death rate of phthisis is generally reckoned one-fifth of total deaths throughout the kingdom. The mortality from phthisis in Cardiff is less than this average. The cold winds and rain of early spring told unfavourably on the inflammatory diseases of the respiratory organs. Bronchitis and pneumonia were very fatal during these months.

Diseases of abdominal cavity maintained only the ordinary rate.

Sporadic diseases of uncertain seat were somewhat in excess of former years, owing to the large number of deaths registered from atrophy, debility, and mesenteric diseases. These diseases were fatal in 90 cases, and are essentially diseases of infancy. I have, therefore, to direct your attention to the sub-joined table of deaths at age.

AGE.		Males.	Females.	Total.
Under 1 year	.....	108	94	202
1 and under 2	.....	37	47	84
2	3 .....	16	18	34
3	4 .....	12	18	30
4	5 .....	9	5	14
				—364
5	10 .....	14	12	26
10	15 .....	12	6	18
15	25 .....	35	17	52
25	35 .....	37	36	73
35	45 .....	30	23	53
45	55 .....	27	16	43
55	65 .....	20	18	38
65	75 .....	17	15	32
75	85 .....	10	8	18
85	95 .....	5	5	10
95 and upwards	.....	1	0	1
		390	338	728

The infantile mortality of Cardiff is high, as of 728, the total number of deaths, 364 were under five years of age. Infant mortality varies considerably in different districts, and in the same districts during different years. It is much influenced by the absence or prevalence of infantile epidemics, as scarlatina, measles, or small pox; but a reference to the previous reports which I have submitted to your board exhibits yearly an excess in deaths in early life, even when the epidemics just alluded to are little fatal.

From an analysis of infant mortality in six town districts I find the average death rate of children under five years of age to be 46 per cent. of total deaths: the highest was 55, the lowest 41; in three semi-rural districts it was 38, in two purely rural it was 33.

In a population constituted like that of Cardiff, having an unusual proportion of labourers and a large number of Irish mendicants, the infant mortality must be expected to be high, and it reaches 50 per cent. of total deaths. The inability of the parents in too many instances to provide for the proper care of their children at a time when the tenacity of life is most feeble, and the over-crowded, ill-ventilated dwelling rooms occupied by night and day, generate a vitiated atmosphere, destructive to the infant constitution, and produce death by diseases of the brain or nervous system, as convulsions, or of the nutritive system, as by tabes, scrofula, or infantile diarrhœa.

I have now to call your attention to the zymotic diseases—which are of a contagious or infectious nature, and dependent, as I have before mentioned, on removeable and preventable causes. The first disease in this class requiring your consideration is fever, and it is satisfactory to find that for some time a very sensible decrease in the deaths registered from this cause has taken place in Cardiff. Streets where formerly fever was never absent, now obtain exemption. In 1846 and 1847, 98 cases of fever occurred in Stanley-street, 72 in Landore-court, 36 in Mary Ann-street, and 30 in Whitmore-lane: for some years, no deaths from fever have been registered in these streets, except one in Mary Ann-street. In 1862, 22 deaths from fever were registered in Cardiff, being at the rate of 0·6 of total population, or little in excess of half the rate of fever mortality throughout the kingdom.

Of these 22, three were seamen removed from on board ship, having arrived in port suffering from fever. I find one died at a house in George-street, on the 19th January, and another in the same house in July. The inhabitants in the immediate neighbourhood complained to me that the house in question was used as a receiving house for sick seamen; a similar complaint was made to me respecting a house in Loudon-square. It is exceedingly undesirable that houses ill-adapted for such a purpose should be so used in a crowded locality, as it necessarily exposes the inhabitants of the immediate neighbourhood to the danger of contagion, especially as the form of fever usually met with on board ship is of a typhus character, a form of all others the most contagious. Still it is equally undesirable that the patient should remain on board a vessel, where the limited accommodation of a sailor's hammock affords but little assistance in the treatment of fever. I would therefore strongly urge the desirability of obtaining accommodation in the shape of a seamen's receiving house near the Docks, sufficiently removed from all other houses to prevent the chance of spreading a contagious disease among the inhabitants of the town. This might be effected by the aid of the brokers or agents in obtaining a *pro rata* contribution from every vessel entering the port, a subscription which would be economical as well as convenient to the shipping interests; it would enable captains of vessels to have their sick sailors removed when their treatment renders it desirable; it would prevent the danger of an outbreak in

the town, as occurred when small pox was introduced by a seaman from a vessel in 1857, when 161 deaths resulted. I have had officially on some few occasions lately to keep vessels at quarantine for a period which might be obviated by the adoption of this suggestion. The rapidity of transit now renders it a matter for your serious consideration, as fever from foreign ports may be here, and has in some ports been introduced with serious results.

Small pox has been introduced into the town at intervals. The first occasion was in February. An inhabitant of Stuart-street, Bute-docks, visited his friends in Somersetshire; among these small pox was prevailing. Immediately on his return home he exhibited the premonitory symptoms of that disease, and passed through the confluent form of it. I could not ascertain that he had been previously vaccinated. An attendant on this case carried the infection home to her own child, who had not been vaccinated; this child died. The disease extended into 3 or 4 more houses, and I learned that 6 more cases occurred. These had been vaccinated, and passed through the disease in a very modified form. I made several visits to the locality, and found the disease confined to these cases.

One death was registered in May, and one in June. These occurred in Frederick-street. They had not been previously vaccinated.

I made strict enquiries into the state of vaccination in the district, and found this had been done in a very satisfactory manner.

Small pox was on board two vessels entering the port during the year; these were kept in a modified state of quarantine. The disease has been introduced into the Union at intervals, on two occasions by seamen, at other times it was observed among the inmates of the Refuge; but no satisfactory evidence could be obtained of its origin. No death from this disease, however, occurred in the house, nor did it extend among the children beyond a very slight degree, the children being protected by vaccination.

Whooping cough was fatal in 25 cases, and croup in 38. The large mortality from these two diseases was doubtlessly attributable to the cold and wet weather during the spring and early part of the summer.

The deaths from diarrhoea were few, being only 9, and were chiefly confined to infants.

Diphtheria contributed 18 deaths to the mortuary table; these occurred in localities requiring sanitary improvements. Henry-street and Adelaide-street, Bute Docks, have in the back-yards privies in a very offensive state, and thus calculated to produce disease of a diarrhoeal or diphtheritous character; of the 18 deaths from diphtheria, 6 occurred within a limited area of these streets. Wood-street, Temperance Town, had putrescent mud and stagnant water in its roadway. The inhabitants of this district called my attention in October to its unhealthy state; I then made an inspection of it. There were several cases of typhoid fever, scarlatina maligna; a death from diphtheria had been registered, as also a death from erysipelas in an adult case, and I visited two others at this time ill with the latter disease. On this occasion I reported to your board the condition of the locality. Some of your members accompanied me through it, and an improvement has been made in several of the streets. Others, however, still continue unremedied, as in the early part of this report I have alluded to.

I append a list of streets, with the number of deaths in each, distinguishing the zymotic deaths from other deaths:



NORTH DISTRICT.												NEWTOWN, (Continued.)											
	Total deaths.	Fever.	Puerperal.	Scarlet.	Measles.	Small-pox.	Hoop. cough.	Diarrhoea.	Croup.	Erysipelas.	Diphtheria.		Total deaths.	Fever.	Puerperal.	Scarlet.	Measles.	Small-pox.	Hoop. Cough.	Diarrhoea.	Croup.	Erysipelas.	Diphtheria.
Bel-street .....												Brought up ..	42	1	2	..	1	..	1	1	4	..	2
Be-street .....	3	..	..	..	..	..	..	..	1			Buzzard-street ..	2	..	..	..	..	1	..	..	..	..	..
Ch-street .....	1	..	..	..	..	..	..	..				Sandon-place .....	11	..	..	..	..	1	..	2	..	..	..
Ch-street .....	4	1	..	..	..	..	..	..				Davies-street .....	3	..	..	..	..	..	..	..	..	..	..
Ch-street .....												William-street ..	7	..	..	1	..	..	..	..	..	..	..
Cherhertown .....	8	1	..	..	..	..	..	..	1			Thomas-street .....	13	1	..	..	..	1	..	2	..	..	..
Ches-street .....												Ellen-street .....	7	..	1	..	..	..	..	..	..	..	..
Chise-place .....	1	..	..	..	..	..	..	..				Rosemary-street ..	4	..	..	..	..	..	..	..	..	..	..
Chit .....												Tyndall-street .....	15	..	..	..	..	1	..	2	..	..	..
Ching-gardens .....	3	..	1	..	..	..	..	..				South-terrace .....		..	..	..	..	..	..	..	..	..	..
Chis-lane .....	10	1	..	..	1	..	3	..				Noah-street .....	2	..	..	..	..	..	..	1	..	..	..
Chward-street .....												Ellen-street-court ..		..	..	..	..	..	..	..	..	..	..
Chell's court .....												Pendoylan-street ..	14	1	..	..	..	..	1	..	..	..	..
Chard's-court .....																							
Chon's Arms-crt. ....	1	..	..	..	..	..	..	..	1				120	3	2	1	2	4	2	11			2
Chnel-street .....	5	1	..	..	..	..	..	..															
Chrch-street .....	2	..	..	..	..	..	1	..															
Chmanhy-street .....																							
Chkweir .....	2	..	..	..	..	..	..	..															
Chen-street .....																							
Chnity-street .....																							
Chen's Bank .....																							
Chnganna .....																							
Chle Farm .....																							
Chle Bells-court .....																							
Chllington-terrace ..																							
Chndor-place .....	2	..	..	..	..	..	..	..															
Chland's-court .....																							
Chson-terrace .....																							
Chyd's-court .....																							
Chhays .....	3	..	..	..	..	..	..	..	1														
Chisturton .....																							
Chstone's-court .....	1	..	1	1	..	..	1	..															
Chtion-terrace .....	4	..	1	1	..	..	1	..															
Chus's-court .....																							
Chnge-cottages .....																							
Chmouth-street .....																							
Chown-court .....	1	..	..	..	..	..	..	..															
Chgusta-street .....	3	..	..	..	..	..	..	..															
Chldford-street .....	1	..	..	..	..	..	..	..															
Chherine-street .....	1	1	..	..	..	..	..	..															
Chle-street .....	2	..	..	..	..	..	..	..															
ChJohn-street .....	1	..	..	..	..	..	..	..															
Chad-street .....	1	..	..	..	..	..	..	..															
Chwbridge-road .....	3	..	..	..	..	..	..	..															
Chath-road .....	1	..	..	..	..	..	..	..															
	64	5	1	2	1	0	4	2	3	0	0												
NEWTOWN.																							
Cham-street .....	4	..	1	..	..	..	..	..	1														
Chlet-street .....	6	..	..	..	..	..	..	..															
Chfryn-street .....	1	..	..	..	..	..	..	..															
Chrch-street .....	7	..	..	..	..	..	..	1	1	..	2												
Chff-street .....	4	..	..	..	..	..	..	..															
Chrgan-street .....	6	..	1	..	..	..	..	..	1														
Chrey-street .....	5	..	..	..	..	..	..	..															
Chr-street .....	5	1	..	..	..	..	..	..	1										1	..	1	..	..
Choria-street .....	4	..	..	..	1	..	..	..											..	..	1	..	..
	42	1	2	..	1	..	1	4	2	..	2		175	5	1	2	6	1	6	2	7	..	6
Carried on ..	42	1	2	..	1	..	1	4	2	..	2		175	5	1	2	6	1	6	2	7	..	6

## LIST OF STREETS WITH DEATHS THEREIN DURING PAST YEAR, (continued.)

EAST DISTRICT.										WEST DISTRICT.									
	Total deaths.	Fever.	" Puerperal.	" Scarlet.	Measles.	Small-pox.	Hoop. Cough.	Diarrhoea.	Group.		Total deaths.	Fever.	" Puerperal.	" Scarlet.	Measles.	Small-pox.	Hoop. cough.	Diarrhoea.	Group.
Ebenezer-street ..	3									St. Mary-street ..	9								2
Union-street ..	12	1					1	1		Landore-court ..	7								1
Frederick-street ..	11						2		1	Charlotte-street ..	7								
Hill's-terrace ..	11				3					Caroline-street ..	6				1				1
Bridge-street ....	7									Mill-lane .....	3								
Love-lane .....	9			1						Hayes .....	3								
East-terrace ..	1									Evans's-court ....	1								
Little Frederick-st	1									Working-street ..	4								
David-street ....	3						2			Wharton-street ..	3								
Stanley-street ...	4									Whitmore-lane ..	5					1			
Mary Ann-street ..	12	1			2		2	2		Rowe's-square ..	1								1
Rodney-street ....	2									Quay-street .....									
Ruperra-street ..	10								1	Court Coleman-row	4						1	1	
Tredegar-street ..	7						1			Union Buildings..	3								
Homfray-street ..	4	1								Baker's-row .....	2								
Jenkins's-court ..	1									Black Lion-court ..									
Canal Bank .....	4								1	Perth-place .....									
Millieent-street ..	17	2							3	Little Mill .....									
Canal-street ....	3									Carpenters' Arms-									
Roberts's-court ..										court .....									
Hill-street .....	2								1	Green Garden-lane	1								
Giles's-ct. David-st										Golden Lion-court.									
Thomas-street ..										Womanby-street..									
Little Union-street										Rising Sun-court ..									
	124	5		1	5	2	6	1	9	Greyhound-court ..									
										Dalton's-court ....									
										Wharf-road .....									
										Sloop-court .....	1								
										Haylock-street ..	9								1
										Wood-street .....	6								
										Eisteddfod-street ..	4	1		1			1		
										Gough-street ....	7								1
										Scott-street .....	7								
										Thomas's-court ..	3								
										Tabernacle-court ..	2				1				
										Victoria-place ....	1								
											99	1			1	2		2	1
																			8
																			1

I conclude this report by illustrating the money value of a reduced death rate, as shown in the following note, extracted from Dr. Gairdner's work on public health; it is in the shape of a hypothetical balance sheet, drawn out by Mr. M'Gowan of Liverpool, and before alluded to. Dr. Gairdner says, in allusion to it, "The estimate of the value of a productive human life to the community is partly founded on an elaborate inquiry by Dr. Farr into 'The Money Value of a Man,' and is decidedly moderate. The estimate of the cost of sanitary works,

supposed to last for upwards of 25 years, is founded on actual data derived from experience.

# SANITARY ECONOMY IN LIVERPOOL.

- 1.—Assuming there have been about 3,750 lives per annum saved to Liverpool by sanitary measures, taking half as males, and four-tenths or 750 as productive, the gain to the community in respect to them, at £300 per life, will be (300 × 750) ..... £225,000
- 2.—And the productive females at half the value ..... 112,500
- 3.—Taking the loss by incapacity to work and expenses on sickness in 70,000 families at £4, which in a town made healthful is saved (70,000 × £4)..... 280,000

Or a total annual saving of 617, 500

Which at twenty-five years purchase would produce the sum..... 15,437,500  
 Deducting outlay for public works.....£859,387  
 Ditto ditto private drainage..... 200,000  
1,059,387

There would remain a nett gain to the community of..£14,378,113

These data are of course supposed to illustrate the saving in a very large community, and are considered worthy of credence by the scientific authorities who have given much attention to the subject. To arrive at a computation of the saving in Cardiff, it would be necessary to consider the *pro rata* saving of 300 lives per annum, such being the diminished number of deaths since the town authorities commenced their sanitary reforms, and the results would show that even with the large outlay expended for the public drainage, private improvements, and other necessary expenses, in a pecuniary point of view, such expenditure has been wisely and profitably made.

I have the honour to be,

Gentlemen,

Your obedient servant,

H. J. PAINE, M.D.

*Medical Officer of Health.*